

TRENDS AND DEVELOPMENTS

California

PELAGIC FISH POPULATION SURVEY CONTINUED:

M/V "Alaska" Cruise 61-A-2-Pelagic Fish:
The coastal waters from Turtle Bay to Ensenada, Baja California, were surveyed (March 6-25, 1961) by the California Department of Fish and Game research vessel Alaska. The objectives were: (1) to sample spawning sardines to determine if there is a relationship between the spring spawners off southern California and central Baja California, and the genetically distinct groups which have been defined as "northern" and "southern" stocks; (2) to locate and sample fish from the transition zone between the two stocks to determine the extent of mixing; and (3) to transport live kelp (Macrocystis sp.) from Turtle Bay, Mexico, to southern California in conjunction with the Ocean Fish Habitat Development project.

Although persistent north-west winds hampered operations, 75 night-light stations were completed. Sardines were scarce. Not one sardine school was observed during 402 miles of night scouting nor was a single adult collected. The paucity of spawning sardines was confirmed by recent U. S. Bureau of Commercial Fisheries surveys which revealed a scarcity of sardine eggs and larvae in the same area.

Anchovies were abundant from Ensenada to Blanca Bay where they were taken at 9 night-light stations. In addition, 275 schools were observed while scouting. Several attempts were made to attract visually-located schools with the night light, but the fish avoided it in each instance.

Jack mackerel were present at 9 stations and Pacific mackerel at 6. Both were abundant in Turtle Bay where Mexican purse seiners were catching them during the daytime.

A gill net, set near the entrance of Turtle Bay, captured 8 California swell sharks (Cephaloscyllium uter), 1 gray smooth-hound (Mustelus californicus), and one leopard shark (Triakis semifasciata). This catch extended the range of the swell shark on the west coast of Baja California about 40 miles southward from the San Benitos Islands. Swell sharks have been reported unreliably from as far south as Alcapulco, Mexico. Two large (146 mm. and 160 mm.) female dwarf perch (Micrometrus minimus) collected at San Martin Island may prove to be the largest ever recorded and were south of the previously reported range for this species.

About 75 kelp plants were transported from Turtle Bay to Santa Monica Bay, Calif., where personnel of the Department's Ocean Fish Habitat Development project transplanted them.

Sea-surface temperatures ranged from 61.9° F. (16.6° C.) at Cedros Island to 52.0° F. (11.1° C.) at Cape Colnett. Most readings were between 55° F. (12.8° C.) and 57° F. (13.9° C.).

Airplane Spotting Flight 61-3-Pelagic Fish: The inshore area from the United States-Mexican Border to Bolinas Bay, Calif., was surveyed from the air (March 11-14, 1961) by the Department's Cessna "182" 9042T to determine the distribution and abundance of pelagic fish schools. Intermittent low clouds made observation difficult along some portions of the central California coast, but complete coverage was possible south of Point Arguello.

More fish schools (1,061 anchovy and 13 sardine) were seen during this flight than were observed on any previous flight since October 1958 when 1,346 anchovy schools were counted north of Monterey Bay. All

but 6 of the schools seen during this month's flight were south of Santa Barbara.

Most of the anchovy schools (1,015) were in 6 school groups. At San Diego, 177 schools were observed along the Coronado Strand; 130 were between Torrey Pines and La Jolla; 231 were off Oceanside; 86 were between Newport Beach and Huntington Beach; 115 were off Point Magu; and 276 were near Port Hueneme. The schools varied in size from small, fragmentary spots close to shore to fairly large, dense schools in deeper water out to about one mile.

Sardines were observed in only two areas. There were 7 small schools two miles southwest of the Oceanside pier and 6 small spots north of Point Piedras Blancas.

Northbound California gray whales, 139 in all, were seen throughout the range of the survey.

Porpoise schools were observed four miles off Goleta Point, near La Jolla Point and near the city of San Clemente. The school near Goleta was very large, and contained hundreds of individuals; the other two were composed of 20-25 animals.



Killer whale (*Grampus rectipinna*).

In addition to the above marine mammals, four small killer whales were seen in Monterey Bay, about one mile off Moss Landing.

Airplane Spotting Flight 61-4-Habitat Development and Pelagic Fish: The coastal waters of southern California to Turtle Bay, Baja California, were surveyed (March 18-21, 1961) by the Department's Twin Beechcraft N5614D. The survey was conducted to gather living plants of the giant kelp (Macrocystis) in Turtle Bay and transplant them into Santa Monica Bay, southern California. The variety of Macrocystis in Turtle Bay exhibits a re-

sistance to warm water, and if it can be successfully introduced into the southern California area it may strengthen the local kelp during periods of warm water and increase the size and health of the local beds. Another purpose of the survey was to observe fish schools, where possible, from San Pedro to Turtle Bay.

The Department's research vessel Alaska was met on March 18, 1961 in Turtle Bay. Despite murky water and heavy surge, particularly outside Turtle Bay, the biologist-divers secured 37 sacks of kelp plants on March 19 and 20. The plants were taken from inside and outside Turtle Bay, in 25 to 50 feet of water. All sacks were submerged in the bait wells of the Alaska and on March 21, 8 were removed, placed aboard the airplane and flown to Torrance Airport. From there they were carried by car and boat to the Hermosa Beach artificial reef where all 8 sacks were tied onto the submerged street-car by the divers. The top of each net sack was opened and the kelp stipes were allowed to trail into the water in a natural manner. The other 29 sacks of kelp were to be brought to Santa Monica Bay in the bait wells of the Alaska.

During the flight to Turtle Bay observations were made on fish schools along the coast. On March 18, during the flight south, 478 schools were observed. Of these, 467 were anchovy, 10 were probably sardine and one, observed south of Cape Colnett, was of unidentified large fish. A majority of the schools (436) were between the Mexican Border and Cape Colnett. The water in this area, along the shore to 3 miles at sea, was green in color. Thirty-seven schools were between Cape Colnett and Punta Canoas. South of Punta Canoas wind and clouds made further observations impossible. During the return flight March 21, a break in the clouds over Sebastian Viscano Bay revealed seven anchovy schools in the water below. Heavy clouds prohibited further observations until the plane was north of San Diego. In the area between Newport Beach and Laguna Beach, from 1 to 4 miles offshore, there were approximately 200 schools of mackerel or bonito.

A total of 9 gray whales, in two groups, was noted during the flight. All the whales were traveling northward. One group of 5 was south of Punta Descanso and the others were in Bahia San Quintin.

Airplane Spotting Flight 61-5-Pelagic Fish: The inshore area from the United States-Mexican border north to the Russian River was surveyed from the air (April 17-20, 1961) by the Department's Cessna "182" 9042T to continue the study of the distribution and abundance of pelagic fish schools.

In all, 185 schools were seen. Strong winds in central California and reduced visibility in southern California were at least partially responsible for the relatively small number tallied. Department research vessel personnel and commercial fishermen reported that anchovy schools were plentiful in some portions of the area surveyed.

Small school groups of anchovies were found one mile north of the Santa Monica pier (73 schools), and between Point Pinos and Carmel Bay (53 schools).

Sardines were seen in only one place, two miles southwest of Carpinteria, where six medium-size schools were counted.

While scouting Monterey Bay, 51 salmon trollers were counted. Most of these boats were working the area about three miles north-east of Point Pinos.

The water in the extreme inshore area from South Laguna to the Mexican border was very dirty and in some places the color was almost that of a typical "red tide" condition.

Note: Also see Commercial Fisheries Review, May 1961 p. 11.

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ROCKFISH STUDIED OFF SOUTHERN CALIFORNIA COAST:

M/V "N.B. Scofield" Cruise 61-S-1-Rockfish: The area around the islands of Santa Catalina, Santa Barbara, Anacapa, Santa Cruz, Santa Rosa, San Miguel, and San Nicolas was surveyed by the California Department of Fish and Game's research vessel N. B. Scofield to catch various species of rockfish (Sebastodes) at different depths for length, weight, maturity, food habits, age, and other studies. Other objectives were to collect ample series of doubtful species for detailed laboratory studies, and to experiment with rockfish tagging techniques.

Baited hand lines were used in shallow waters, and baited set lines in deep waters. Fishing was in depths of 40 to 1,200 feet,

adjacent to, and between, the southern California islands. Twenty species of rockfish were taken, plus several other kinds of fish.

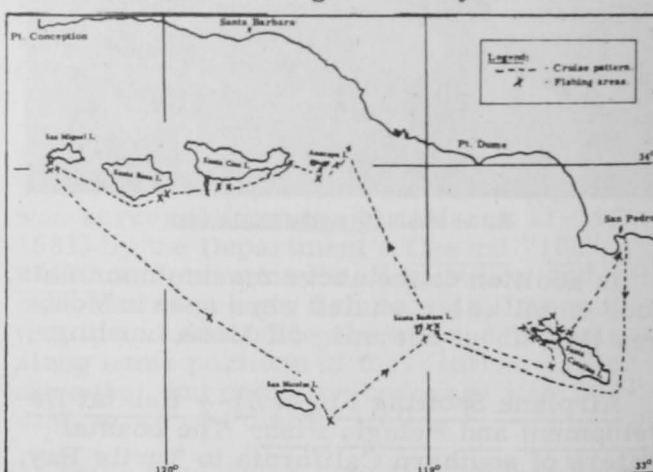
Length, weight, and maturity information was taken on all rockfish. Stomach contents were noted when they were not disgorged. Scales or otoliths were taken from certain species for age studies.

Large pink rockfish, Sebastodes eos, and whitebelly rockfish, S. vexillaris, were frozen for studies to determine their validity--if they are distinct from the greenspotted rockfish, S. chlorostictus, and the copper rockfish, S. caurinus, respectively.

Experiments were conducted to determine methods of tagging rockfish in waters of various depths.

Because of reduced pressure, when rockfish are brought to the surface from moderate depths gas expansion occurs in the ductless air bladder and sometimes in the eye sockets. However, with deep-water rockfish the eyes are invariably popped and the air bladder greatly expanded. Often, the air bladder will evert the stomach into the mouth. Just as often, the air bladder itself may be forced into the mouth through a slit in the throat.

In shallow-water species, wherein the eyes had not popped, the air bladder was successfully deflated by inserting a hypodermic needle through the body wall.



M/V N. B. Scofield Cruise 61-S-1-Rockfish (Feb. 16-28, 1961).

Methods were developed for deflating, anesthetizing, and tagging blue rockfish caught as deep as 230 feet. A 1:15,000

concentration of MS222 put blue rockfish under a proper level of anesthesia in 4 to 7 minutes. All specimens recovered, some after spending as long as 30 minutes in the solution. If the solution were applied directly to the gills with a syringe, a 1:750 concentration caused proper sedation in less than a minute.

Approximately 100 blue rockfish, *S. mystinus*, were deflated and placed in a live-bait tank aboard the N. B. Scofield. Of 50 that were tagged with a large, numbered, Petersen-type tag (for visual observations of individual fish), 38 survived. These, in addition to two whitebelly rockfish and a vermilion rockfish, were delivered to Marineland of the Pacific, for further observations.

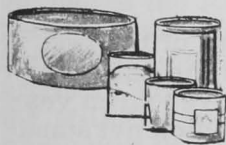
A total of 42 blue rockfish, each bearing a plastic spaghetti streamer tag, were released at sea around the various islands.

In an experiment designed to tag deep-water rockfish, without bringing them to the surface, a detachable tagged-hook was used. This consisted of a fish hook with a numbered plastic disc fastened to the hook eye. The hook was attached to a fishing line, or a set line, by a thread that would break with a three-pound strain. Fish weighing a pound or less were retained, but larger fish broke the thread after accepting the baited hook. About 100 baited, tagged hooks were released at depths of 90 to 1,200 feet. Two hooked-tagged fish were recovered in the same areas where fishing releases were taking place. One was a 1½-pound treefish, *S. serriceps*, from a depth of 120 feet; the other a 6½-pound cow rockfish, *S. levis*, from 525 feet. If this method of tagging proves practical, movements of deep-water rockfish, as well as certain other fish, might be traced.



Cans--Shipments for Fishery Products, January-March 1961

Total shipments of metal cans during January-March 1961 amounted to 22,757 short tons of steel (based on the amount of steel consumed in the manufacture of cans) as compared with 22,023 tons in the same period a year ago. Canning of fishery products in January-March this year was



confined largely to tuna, Gulf oysters, and Pacific and jack mackerel. Increased shipments of metal cans during January-March this year as compared with the same months in 1960 were probably due to an increase in the California pack of canned tuna.

Total shipments of metal cans during January-February 1961 amounted to 13,208 short tons of steel as compared with 13,609 tons in the same period a year ago.

Total shipments of metal cans during January 1961 amounted to 7,080 short tons of steel as compared with 7,538 tons in the same month a year ago. The decrease of about 6.0 percent in the total shipments of metal cans in January this year as compared with the same period of 1960 was probably due to the sharply lower packs of both Pacific and jack mackerel.

Note: Statistics cover all commercial and captive plants known to be producing metal cans. Reported in base boxes of steel consumed in the manufacture of cans, the data for fishery products are converted to tons of steel by using the factor: 23.0 base boxes of steel equal one short ton of steel.



Central Pacific Fisheries Investigations

ALBACORE TUNA TAGGING RETURNS INDICATE SINGLE POPULATION IN NORTH PACIFIC:

On the basis of tag recovery data, age and growth information, and distribution and size frequency data from the various fisheries, a model of the migration of albacore tuna in the North Pacific Ocean has been developed by biologists of the U. S. Bureau of Commercial Fisheries. This model, consistent with the hypothesis that there is a single population of albacore in the North Pacific Ocean, is:

A varying portion of the 2-, 3- and 4-year old fish and nearly all of the older fish in the United States fishery migrate westward each fall into the Japanese long-line fishery, and during the following spring, into the Japanese live-bait fishery. The remainder of the fish from the area of the United States fishery move westward to the mid-ocean waters of the North Pacific, some as far west as the fringe of the Japanese long-line fishing grounds. Those fish that do not move into the Japanese live-bait fishery return to the United States fishery the following

season. Thus, some fish may be available to the United States fishery for as many as 4 or 5 successive seasons.

Albacore enter the Japanese winter long-line fishery from both the United States fishery (westerly migration in the fall) and the Japanese live-bait fishery (easterly migration in late summer). Each spring, a large portion of these fish (age groups 2-5), migrate westerly from the long-line fishery grounds into the live-bait fishery, while a few separate and move eastward into the United States fishery. The larger adults (6-years or older) move southward from the winter long-line fishery into the tropical and subtropical waters to the spawning grounds of the North Pacific albacore population.

It appears that the major portion of the recruitment into the exploited stock (recruitment begins at age 2 and is completed at age 3) takes place in the eastern rather than the western North Pacific. There is a greater volume of migration of the commercial sizes of albacore in a westerly direction from the United States fishery into the Japanese fisheries, than vice versa.

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AREA SOUTH AND WEST OF HAWAII SCOUTED FOR SEASONAL SKIPJACK TUNA:

M/V "Charles H. Gilbert": As part of a long-term program of Central Pacific Ocean surveys planned by the U. S. Bureau of Commercial Fisheries Biological Laboratory at Honolulu with the object of learning more about the life and habits of the skipjack tuna (aku), the Bureau's research vessel Charles H. Gilbert completed a 5-week cruise on May 8, 1961. The particular purpose of the cruise was to locate concentrations of skipjack at some distance from the Islands prior to the beginning of the regular summer fishing season and thus to obtain information concerning the origin and migration routes of the schools which support the summer fishery in Hawaiian waters.

Aku schools were more abundant near Johnston Island and in an area about 150 miles south of Oahu than they were to the westward, between Kauai and French Frigate Shoals. In both areas most of the schools were composed of small fish. Near Johnston Island a number of skipjack were marked with plastic tags and released. Recapture of any of these marked fish in the Hawaiian aku fishery this summer would provide an im-

portant clue to the origin of the schools which migrate into Island waters seasonally, and commercial and sport fishermen are urged to report full details of any such catches to the Honolulu Laboratory.

Scientists aboard the vessel collected samples of skipjack blood in several areas covered by the cruise, including the first such samples from waters to the west of Hawaii. When these samples are classified into blood types and compared with blood collected from skipjack taken close to the Islands and with other samples from areas to the south, such as the Line Islands and the Marquesas, the results are expected to provide further clues to the relationships and movements of the central Pacific skipjack populations.

Drift bottles, for studying the direction and speed of ocean currents around the Hawaiian Islands, were released throughout the cruise. All professional and part-time "beachcombers" are requested to be on the lookout for the bottles, each of which contains a conspicuous orange-and-white striped card. The return of these cards (appropriately filled in) to the Biological Laboratory will be of great help. The finders will be informed of the date and place of release of the bottles they pick up.

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NEW TYPE GILL NET FOR SKIPJACK TUNA FISHING SHOWS PROMISE:

Fishery biologists and fishermen of the U. S. Bureau of Commercial Fisheries Biological Laboratory at Honolulu were encouraged by the results of three test operations carried out May 13-16, 1961, off Lanai and Waiane, Oahu, in which a gill net of monofilament line was used to catch skipjack (aku) tuna. The monofilament net, made of a clear, transparent synthetic fiber similar in appearance to the nylon leaders used by sport fishermen, was fished from the Bureau's research vessel Charles H. Gilbert along with an equal length of net made from conventional green-dyed nylon twine. Of the total of 326 skipjack tuna caught in the nets, all but 5 were in the monofilament portion.

The difference in visibility of the two kinds of net, as viewed from the underwater observation chambers of the research vessel, was very striking--the nylon net standing out conspicuously in the clear water, while the monofilament net was almost invisible to the human eye.

The strategy employed in the tests was to slow down the movements of a school of skipjack by chumming with live bait, set the net close to the school, and then throw additional live bait to induce a "feeding frenzy" that would overcome the skipjack's usual caution. It appeared to the observers that those fish which were not in such a state of frenzied excitement were to some extent aware of even the transparent monofilament net.

The gill net, which was about 1,200 feet long and 24 feet deep, could be hauled aboard the vessel in about 20 minutes by means of a hydraulic-powered device called a "Power-Block," and the 3-5 pound skipjack passed through the block along with the net without being seriously damaged.

The skipjack net fishing experiments were aimed at finding a method to enable Hawaii's sampan fleet to harvest skipjack more efficiently and economically, so as to meet the competition of better equipped fishermen in other areas. The development program is only in the preliminary stage, and the test operations were made with a small net improvised from materials on hand. The results were however, considered encouraging as they indicated that skipjack can be taken in monofilament gill nets in numbers large enough to make further experimentation possible and worthwhile. The Laboratory plans to construct a longer, deeper net entirely of monofilament web, using funds made available especially for this purpose. If proposed State financial support, presently pending in the Legislature, is forthcoming, this type net will be thoroughly tested aboard a sampan of the skipjack tuna fleet, under the actual conditions which the method will have to meet in order to be of help to the Hawaiian tuna industry.



Federal Purchases of Fishery Products

DEPARTMENT OF DEFENSE PURCHASES, MARCH 1961:

Fresh and Frozen Fishery Products: For the use of the Armed Forces under the Department of Defense, about 1.6 million pounds (value \$701,000) of fresh and frozen fishery products were purchased in March 1961 by the Military Subsistence Supply Agency. This was lower than the quantity purchased in February 1961 by 10.0 percent and 18.9 percent under the amount purchased in March

1961. The value of the purchases in March this year was lower by 23.9 percent as compared with February and 35.2 percent less than for March a year earlier.

Table 1 - Fresh and Frozen Fishery Products Purchased by Military Subsistence Supply Agency, March 1961 with Comparisons

QUANTITY				VALUE			
March		Jan.-Mar.		March		Jan.-Mar.	
1961	1960	1961	1960	1961	1960	1961	1960
. (1,000 Lbs.) (\$1,000)			
1,568	1,934	5,167	5,298	701	1,081	2,547	2,730

During the first 3 months of 1961 purchases totaled about 5.2 million pounds (valued at \$2.5 million)--a decrease of 1.5 percent in quantity and 6.7 percent in value as compared with the same period in 1960.

Prices paid for fresh and frozen fishery products by the Department of Defense in March 1961 averaged 44.7 cents a pound, about 8.1 cents less than the 52.8 cents paid in February and 11.2 cents less than the 55.9 cents paid during March last year.

Canned Fishery Products: Sardines were the only canned fishery product purchased for the use of the Armed Forces during March this year. In the first three months

Table 2 - Canned Fishery Products Purchased by Military Subsistence Supply Agency, March 1961 with Comparisons

Product	QUANTITY				VALUE			
	March		Jan.-Mar.		March		Jan.-Mar.	
	1961	1960	1961	1960	1961	1960	1961	1960
 (1,000 Lbs.) (\$1,000)			
Tuna	-	252	1,365	1,269	-	122	603	573
Salmon	-	-	-	-	-	-	-	-
Sardine	24	15	60	46	12	6	29	20

of 1961, purchases of canned tuna were up 7.6 percent and canned sardines were up 30.4 percent as compared with the same period in 1960. No canned salmon was purchased during January-March 1960 or 1961.

Note: Armed Forces installations generally make some local purchases not included in the data given; actual total purchases are higher than indicated because local purchases are not obtainable.

VETERANS ADMINISTRATION REQUIREMENTS FOR CANNED FISH FROM 1960-61 PACK:

Early this year the Veterans Administration announced its estimated requirements of various canned food products, including fishery products (table 1).

Table 1 - Veterans Administration Requirements
for Canned Fish from 1960-61 Pack

Canned Product	Can Size	Quantity (Dozen Cans)
Salmon, red, or sockeye	1 lb.	17,517
Salmon, skin and backbone removed	4 lb.	2,802
Salmon, red or sockeye, sodium content restricted to not more than 60 mg. per 100 grams	1/2 lb.	8,211
Tuna, light meat, chunk style, sodium content restricted to not more than 60 mg. per 100 grams	1/2 lb.	9,122
Tuna, light meat, chunk style in vegetable oil	4 lb.	5,828
Sardines	1 lb.	5,212

Items listed are purchased by the Marketing Division for Subsistence, Veterans Administration Supply Depot, P. O. Box 27, Hines, Ill.



Fish Flour

DEVELOPMENT FOR HUMAN CONSUMPTION SUPPORTED BY SENATORS FROM MASSACHUSETTS:

With reference to the development of fish flour for human consumption in the United States, the Senators from Massachusetts made statements before the Senate on May 18 which appeared in the Congressional Record of that date. In addition, inserted in that publication on the same date by Senator Leverett Saltonstall was an editorial which appeared in the May 15, 1961, issue of the New Bedford Standard-Times and by Senator Benjamin A. Smith II a letter received from Interior Secretary Steward L. Udall.

In part, Senator Saltonstall pointed out:

"... I am happy to report to the Senate a development which should help considerably in solving the problems of the fishing industry, and which may also be a significant aid to U. S. foreign policy."

He went on to state that at New Bedford, Mass., a fishery products firm is converting whole, fresh fish into a fish flour that will be an important supplement to human food. Then he added:

"It can be sold for only 15 cents a pound. It appears to be the cheapest source of animal protein in the world. It can be stored for long periods of time without refrigeration. It can be mixed with grains to give undernourished peoples a balanced diet. We are confident that we have in this product a helpful answer

to widespread hunger adjacent to oceans teeming with fish.

"For several months I have been working with my colleague from Massachusetts, Senator Smith, Senator Douglas, of Illinois, Congressman Keith, of the New Bedford District, Mayor Lawler, and the members of the New Bedford City Council to secure full public approval of this unique product.

"We are asking this body to add \$200,000 to the budget of the Bureau of Commercial Fisheries to speed research on the product, to study other processes, to investigate the possibility of manufacturing this substance aboard trawlers while they are still at sea, and to check all the possible uses for human food.

"I request that an editorial entitled "Fish Flour Fills Need," be printed in the body of the RECORD at the end of my remarks. This editorial is dated May 15, 1961, and it appeared in the New Bedford Standard-Times. This is good evidence of the fine community support which is available to this unique Massachusetts enterprise"

In part, Senator Smith added:

"... "At a recent worldwide conference in Rome it was estimated that 500 million people suffer from the type of protein deficiencies which small, inexpensive dosages of fish flour in their diet could cure. Mr. George McGovern, director of the food-for-peace program has expressed considerable interest in it.

"An expansion of the sales of this product would also be of enormous benefit to the ailing American fishing industry...."

"I would also like to place in the RECORD a letter which I received recently from Secretary of the Interior Udall. This letter, I feel outlines well the merits of fish flour and the arguments in favor of its being sold worldwide. It also tells of some of the obstacles facing the present fish flour program. I am in thorough agreement with the Secretary's remarks on these problems...."

Secretary Udall's letter as inserted in the Congressional Record follows:

UNITED STATES
DEPARTMENT OF THE INTERIOR
Office of the Secretary
Washington, D.C.

May 12, 1961

Hon. Benjamin A. Smith II,
U. S. Senate,
Washington, D. C.

Dear Senator Smith:

Thank you for your letter of April 26, concerning the Rome fish meal conference and fish flour. It is indeed encouraging that the prices of fish meal are now on the rise.

We were particularly pleased to learn of your interest in fish flour. It is our feeling, too, that fish protein concentrate offers tremendous potential in feeding hungry people all over the world. We in the Department recognize that such a product cannot, in all conscience, be sold abroad until approval for its use in America is first obtained from the Food and Drug Administration.

Mr. Donald McKernan, Director of our Bureau of Commercial Fisheries, is working closely with Mr. Harold Putnam, counsel, Senate Select Committee on Small Business, in an attempt to have Food and Drug approve the interstate marketing of fish flour for domestic human consumption. Mr. George Larrick, Commissioner of the Food and Drug Administration, in reply to our formal request for approval of fish flour, stated whole fish flour to be a product classed as adulterated under section 402(a) (3) of the Federal Food, Drug and Cosmetic Act. The Food and Drug Administration's rejection of fish flour is based on their decision that it consists, in whole or part, of filthy material. Their view is that heads, tails, viscera contents, etc., of large whole fish constitute filthy matter in that they are "esthetically objectionable" to the consumer.

We in the Department disagree with the Food and Drug's position on this matter. It is our feeling that these so-called esthetically objectionable components of fish are either removed or else totally lose their identity during processing into fish flour. A direct analogy exists in the preparation of gelatin made from beef hoofs. Here the raw materials used have the same esthetic objections as whole fish. No one would seriously affirm that all traces of any objectionable materials are removed, yet the product is marketed and widely used. Another interesting point is that millions of pounds of whole or headed sardines are consumed annually in this country. This seafood, with its viscera and tails intact, is both delicious and highly nutritious.

Since the first of the year, Mr. McKernan and representatives of his staff have had several meetings with officials of the U. S. Food and Drug Administration to encourage them to change their position on this matter. We have also prepared a standard of identity that will permit production of only the highest quality fish flour. Despite these efforts, however, the Food and Drug Administration has not changed its original position on the use of fish flour. It is our understanding that Secretary Ribicoff is requesting the Food and Drug Administration to hold public hearings to consider this matter. At that time we will again present our views regarding approval of fish flour.

Another problem is the absence of a suitably low-cost method of producing a uniformly high quality fish flour. It is the opinion of our scientists and those of the World Health Organization, Food and Agriculture Organization and the United Nations Children's Fund that no truly satisfactory method is known to exist for production of an inexpensive and highly nutritious fish protein concentrate. Comprehensive engineering and product utilization research is needed before we can produce a fish flour that we can use to feed the undernourished peoples of the world.

The Department feels that development of a suitable process for producing fish flour would be in the best interest of our country, both in helping the fishing industry and in furnishing a high quality animal protein concentrate to our neighbors in the underdeveloped countries. Such a program as this would appear to dovetail well into President Kennedy's food-for-peace plans and to further improve our social-political relations around the world.

The Department does not yet have a formal research program on fish flour, but is hoped that we will be able to initiate one in the very near future.

Sincerely yours,

Stewart L. Udall,
Secretary of the Interior

Frozen Foods

NEW TIME-TEMPERATURE INTEGRATOR EFFECTIVE TESTING DEVICE:

A device that measures and integrates time and temperature to maintain quality in frozen foods has been developed by scientists of a Minneapolis firm. The miniature device, called a time-temperature integrator, tells the time-temperature experiences of frozen foods during various stages of handling and storage. It operates by means of electrochemical action and is about the size and shape of a cigarette, weighing only a fraction of an ounce. In use, it is simply placed with packages of frozen food.

The industry is still trying to determine how best to employ the tiny device. The firm's vice president of research said the U. S. Army Quartermaster Corps, which assisted in early stages of development, has tested 2,000 early models of the integrator with favorable results, and plans to test prototype production models this summer.

The integrator senses and records time and temperature as an integral function. The combined information is shown on a scale that is read as easily as a scale on an ordinary thermometer.

The firm's research specialist emphasized that the integrator does not measure food quality directly. It produces a time-temperature exposure reading that is consistent with data compiled by the U. S. Department of Agriculture on the deterioration rates of various frozen foods at different temperatures.

"This data shows," he said, "that frozen food maintains quality well at low temperatures (0° F. or below), but it becomes increasingly difficult to maintain quality at higher temperatures.

"Some foods that would maintain top quality for a year at 0° F. would suffer appreciable quality loss in a few months at 10° or in a few days at 20° "

He said that devices previously available were simply temperature indicators. This was of no value if it was not known how long the food remained at a certain temperature--such as above zero degrees.

The device can show the type of handling that foods have received and indicate when a laboratory quality check should be made. Also, it can be used to determine which lots of food should be moved from inventory early because of the amount of quality reserve left.

The new indicator is an outgrowth of three years of research by the firm's scientists in the field of electrochemistry. It is being produced on a pilot basis at the research center, which is making it available to the frozen food industry for experimental uses.

The integrator has no moving parts, no external wiring or power sources, and requires no special calculations. It is completely sealed in plastic and is durable enough to be packed in with most frozen food packages without additional protection. After use it is discarded.

Heart of the device is a glass tube filled with a special solution, the nature of which is not disclosed. Around this tube is wrapped a specially treated yellow paper sleeve.

At the ends of the paper are two metal electrodes of different material and these are connected by a copper ribbon. The entire assembly is sealed in a plastic tube.

It operates like a tiny electrolytic battery. To start its action, the indicator is squeezed with a special type of pliers furnished by the manufacturer of the device. This breaks the capsule of solution inside.

The solution wets the yellow paper and connects the two dissimilar metal electrodes, allowing an electrochemical reaction to start.

The reaction causes the yellow paper to turn red, beginning at one electrode and moving toward the other. The speed with which this occurs is dependent on temperature. The movement is always in the same direction. Cooling at a lower temperature merely slows the movement and will not cause it to back up.

In the current models, the red zone moves the full length of the scale in about 20 days at 20° F., two months at 15° F., six months at 10° F., and more than one year at -0° F.

Above 20° F., the indicator is designed to operate especially fast. At 25° F., the indicator will travel full scale in a couple of days.

The device may be of interest to the fishery industry, and might possibly be used as an indicator to determine the deterioration rates of fishery products at different temperatures while in cold storage, in transit, or in retail cabinets. (Food Field Reporter, March 29, 1961.)



Fur Seals

PRICES FOR ALASKA SEAL SKINS DROP AT SPRING 1961 AUCTION:

The spring 1961 auction sale of U. S. Government and other foreign-produced fur seal skins was held at the processing plant at St. Louis, Mo., on April 20 and 21, 1961. Representatives of the Canadian Department of Fisheries and the Japanese Government also attended the sale.

Sales for the United States-owned seal skins totaled about \$1,950,000. The average price for all the conventionally-processed Alaska seal skins declined 14 percent to an average of \$87.88. The United States share of the skins was sold as follows: Black from \$128 to \$69 per skin for an average of \$93.33, a decline of 8.7 percent from the October 1960 sale; Kitovi, from \$138 to \$57 for an average of \$87.20, a decline of 17.2 percent; Matara, from \$118 to \$58 per skin for an average of \$83.57, a decline of 18.3 percent. The decline in average prices was generally expected, due to a general decrease in the prices of other high-quality furs. However, a disappointment was experienced in the sale of the sheared female or "Lakoda" skins. The average price for 10,468 of those furs was only \$11.99 as compared to \$36.05 at the fall 1960 sale when those skins were first presented to the fur trade. At the current sale, the Lakodas were divided into four classes or grades, the first two grades bringing a much higher price than the last two grades. Prices ranged from \$61 for the largest grade I skins to \$3.50 for the smaller grade IV skins.

Of the female skins processed, about 25 percent were rejected as unfit for sale.

The fall auction of Alaska fur seal skins is tentatively scheduled to take place on October 12-13, 1961.

Note: Also see Commercial Fisheries Review, Dec. 1960 p. 32.



Gear

INSTRUMENT DESIGNED TO RECORD DEPTH OF PURSE SEINE AS FUNCTION OF TIME:

Two scientists from the U. S. Bureau of Commercial Fisheries, San Diego, California, Biological Laboratory were aboard the commercial purse seiner West Point during a trip which extended from April 3 to April 27, 1961. This was the second of two trips made with the purpose of evaluating the use of sonar to locate and follow schools of tuna. Examination of the records and the evaluation are under way and will be reported later.

During the second trip, tests were made of an instrument designed by one of the scientists to record the depth reached by the seine (430 fathoms long and 42 fathoms deep) as a function of time. This device was attached to the lead line of the net. The results must be considered preliminary, since this was the first model put into use and it was not accurately calibrated for depth. The first test revealed that the lead line took about six minutes to reach depth. The depth recorded in this case was about 26 fathoms. Further observations along this line were made in June. Several of the instruments will be available and can be attached to various parts of the net.

* * * * *

NEW CONVOLUTED FLOAT DEVELOPED TO REPLACE DAMAGED PURSE-SEINE FLOATS:

A Seattle, Wash., inventor has developed a convoluted (coil-spring type) float that has attracted considerable attention on the part of purse-seine fishermen. The new float, which has been patented, is expected to be used to replace damaged floats easily without the time-consuming threading method

now employed in replacing floats on many purse seines. The new floats are not yet on the market. (Fisherman's News, April 20, 1961.)



Great Lakes

LAKE TROUT PLANTING PROGRAM FOR UPPER GREAT LAKES FOR 1961:

An estimated 1,322,000 yearling lake trout will be planted in Lake Superior from Michigan, Canadian, and Wisconsin hatcheries during the latter part of May and early June as part of a broad, long-range program to revive the lake trout fishery of the upper Great Lakes.

Plans coordinated by the Great Lakes Fishery Commission are to release some 560,000 yearlings from State and Federal hatcheries in Michigan. Canada will release about 506,000 lake trout while Wisconsin will release 255,700. These fish will not become sea lamprey targets for at least several years after being released because of their small size. Most of the planting stock will be made up of one-year-olds between 5 and 6 inches long. Although final results will not be known until 1962, early studies raised hopes that the U. S. Bureau of Commercial Fisheries scored a success toward control of the sea lamprey in tributary streams of Lake Superior where the chemical treatment program was completed in the fall of 1960.

The State of Michigan's planting program calls for 120,000 yearling lake trout to be released in Whitefish Bay. Some 202,000 yearlings will be released in Keweenaw Bay, while the Munising area will receive 70,000 young trout. Stock for these plantings will come from the U. S. Fish and Wildlife Service hatchery at Pendills Creek. Lake trout to be released in Keweenaw Bay were reared from eggs collected in Crystal, Glen Higgins, Elk, and Torch lakes during the fall of 1959.

Another 120,000 of the Federal hatchery's trout will be transferred to Wisconsin and combined with that State's releases in the Bayfield area of Lake Superior. Some 48,000 trout will be taken from Wisconsin's Conservation Department Watersmeet hatchery for an experimental planting in the Ontonagon area.

In addition to the Lake Superior plantings, approximately 95,000 lake trout were sched-

uled to be released during early May in Lake Michigan, offshore from South Point near Charlevoix. Planting stock for this release was purchased from Illinois, and reared at the Fish and Wildlife Service Charlevoix hatchery.

The planting is the fourth in a series of experimental releases to learn more about the distribution and movements of hatchery-reared lake trout in Lake Superior, and to determine how long these fish can survive before being attacked by sea lampreys.

Hopes of launching a large-scale lake trout stocking program in Lake Michigan are contingent on findings of this study. All fish released will be fin-clipped to aid research.



Great Lakes Fishery Investigations

LAKE ERIE 1961 FISH POPULATION SURVEY CONTINUED:

M/V "Musky II" April 1961: Operations of the U. S. Bureau of Commercial Fisheries research vessel Musky II on Lake Erie began in early April with trawl tows at Stations No. 4 (East Harbor) and No. 5 (Sandusky Bay). The rather uniform catches consisted mostly of yellow perch and spot-tail shiners. As expected, the bay station produced a larger variety of species and included a greater number of the more common fish.

Yellow perch of the 1959 year-class were quite abundant. Their lengths varied between 5.5 and 8.3 inches and averaged 6.9 inches. Yearling perch were taken in lesser numbers. They averaged 3.5 inches in length; 0.5 inches shorter than the members of the 1959 year-class at this time a year ago. One out of three of the yearling males was sexually mature. Only an occasional two-year-old male was found to be immature whereas over 50 percent of the two-year-old females taken were undeveloped. In general, female perch ran a bit larger in size than males of the corresponding year class.

Data were obtained on other commercial species including white bass, sheepshead, channel catfish, and smelt. Very few yearling smelt have been observed thus far in spite of an apparently successful hatch last year.

A more intensive study has been initiated to follow the development of dissolved oxygen depletion and related phenomena in Lake Erie. The vessel and crew were used during alternate weeks of the month for this purpose. Nannoplankton and bottom samples were collected in addition to regular water samples for later analyses in determining contents and concentrations of various elements. Water temperatures of the lake in the Sandusky area averaged 39° F. at the beginning of April, increasing to about 46° F. by the end of the month. Dissolved oxygen concentrations ranged quite high, showing the lake to be well saturated at this time of year.

Scale samples and measurements of major species were also collected during the month of April from commercial landings at the following ports: Monroe, Michigan; Bono, Sandusky, Vermilion, and Ashtabula, Ohio. These collections will be supplemented with samplings from Wheatley, Ontario; Erie, Pa.; and Dunkirk, N. Y., which are being taken by biologists of neighboring state and provincial agencies. Samples from at least 150 net-run specimens of each of the seven major species (at each port) make up these collections.

The spring commercial catches of the more select species were not heavy. Few blue pike, whitefish, and ciscos were caught. Good landings of yellow-pike were rather spotty. While the larger yellow-pike were taken in greater quantity than anticipated, the 1959 year-class usually dominated the catch. These two-year-olds, averaging about 15-16 inches, have reached the "borderline" category. Many can be marketed either as No. 2's or 1's depending on price and demand.

The hatch and survival of young yellow-pike in 1960 was considered poor. However, commercial fishermen are now reporting varying numbers of 8- to 11-inch yellow-pike in their lifts. The reports are encouraging. Even so, the survival of the 1960 year-class cannot begin to approach that of the 1959 year-class which is not believed to be exceptionally high as compared to years of former abundance.

In Ohio waters, the sorting of the two-year-old yellow perch from trap net catches presented somewhat of a problem. The vast majority of the perch were well below the 8½-inch minimum size limit. Normal growth, however, should place many of them in the "keeper size" toward the end of the year.

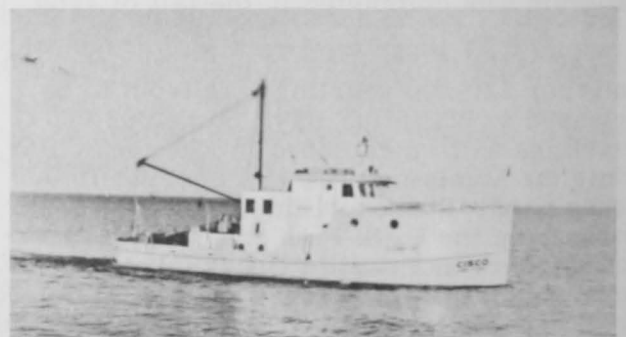
Large numbers of sheepshead were available for the taking. Some fishermen were landing them while others said they could not handle them until a higher price and a steadier market was assured.

Note: Also see Commercial Fisheries Review, June 1961 p. 23.

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RESEARCH VESSEL "CISCO" PROGRAM FOR 1961:

The recently developed trawl fishery for chubs and the anticipated rehabilitation of the lake trout in Lake Michigan make it important that an accurate estimate of the present chub populations be obtained, since it will be desirable to know what changes, if any, these developments will bring about. During 1960 the U. S. Bureau of Commercial Fisheries research vessel Cisco, by systematically fishing standardized gill nets and trawls, was able to obtain what is thought to be a reasonably good basis for future comparisons of chub populations in southern Lake Michigan. In 1961 the same program will be carried out in the northern portion of the lake. The standard gear (nylon gill nets of 9 mesh sizes from 1¼- to 4-inch mesh totaling about ½-mile per gang, and bottom trawls of a type used by Lake Michigan chub fishermen) will be fished mostly off Frankfort, Charlevoix, and Manistique, Mich., and Sturgeon Bay, Wis. Although the primary interest will be in chubs, other species, especially the recently stocked lake trout, will also be of concern.



Cisco, research vessel of the Service's Great Lakes Fishery Investigations.

A second objective during 1961 will be to compare present chub populations with those of 1955. The identical linen gill nets which were set off Charlevoix, Manistique, and Ludington, Mich., in 1955 will be set in the same manner as to location, depth, and time of year, in 1961. A similar study off Grand Haven, Mich., in 1960 revealed that in the

intervening years since 1954 there had been a noticeable change to a higher proportion of bloaters among the chub stocks of that area.

The 1961 program will also include experimentation with a 40-foot modified British Columbia midwater trawl. The trawl will be equipped with a depth and temperature telemetering unit. The primary concern will be to explore its possibilities as a biological collecting device, but its potential as a commercial chub fishing net will also be examined.

Limnological collections and observations will be made each cruise at six stations on transects between Charlevoix and Manistique and between Frankfort and Sturgeon Bay.

* * * * *

SEA LAMPREY CONTROL PROGRAM FOR 1961 UNDER WAY:

The sea lamprey control unit of the U. S. Bureau of Commercial Fisheries Great Lakes Fisheries Investigations started the 1961 field work on both Lake Superior and Lake Michigan in March. Eighty percent of the electrical barriers to be operated on Lake Superior were activated by March 31, 1961. The chemical control unit had treated only one small Lake Michigan tributary, but continued to make progress in surveys of sea lamprey streams and in bio-assays to learn the effects of larvicides in water from different tributaries.



Hawaii

SKIPJACK TUNA LANDINGS ABOVE AVERAGE FOR FIRST FOUR MONTHS OF 1961:

Landings of skipjack tuna in Hawaii during April 1961 were estimated to be 680,000 pounds, about 130,000 pounds above the 12-year (1948-59) average. Approximately 10 percent were fish under 8 pounds, 45 percent 8 to 15 pounds, and 45 percent between 15 and 25 pounds in weight. Nineteen vessels were fishing during April with an average catch of 35,800 pounds per vessel, over 8,500 pounds above the average for the preceding 10 years.

Total landings for the first four months of 1961 were estimated to be 1,815,000 pounds, 578,000 pounds above average. A large part of this increase was attributed to March landings, which were more than twice the average.

Bait (nehu) was quite scarce during early April, but was fairly easily obtained by the end of the month.



Inspection of Fishery Products

FISHERY PRODUCTS INSPECTION MEETING HELD IN WASHINGTON:

A day's meeting, open to all interested in fish and the fishing industry--producer, processor, distributor, consumer--was scheduled by the U. S. Department of the Interior's Bureau of Commercial Fisheries for June 9, 1961, in Washington, D. C.

The purpose of the meeting was to discuss the Department's inspection program for fishery products, to consider new approaches which will make inspection services available to small industry groups, and to explore the possibilities of establishing quality standards and inspection services for fresh fish. A prior meeting was scheduled for June 8 primarily for representatives of firms now using the Department's continuous inspection service.

The Bureau of Commercial Fisheries has been offering its fishery products inspection services for three years. Now it seeks to determine whether or not the program as originally designed is satisfying the needs of the consumer and of the many diverse segments of the fishing industry.

The Bureau believes that this can best be accomplished by meeting with the management of industry and other organizations to discuss existing problems and future plans for inspection activities.



Irradiation Preservation

IRRADIATION RESEARCH PROMISES LONGER TERM SHELF-LIFE FOR FOODS:

A recently installed irradiation facility at Oregon State College will be used in studies to make possible long-term storage of present short-shelf-life food items. According to the College, sterilization by radiation offers the first promising new principle of food sterilization since the discovery of the canning technique in 1809.

One of the College's professors of chemistry who is also chairman of the College's Radiation Safety Committee, said that with the new \$20,000 cobalt irradiation facility, it will be possible for the College's scientists to subject focus to 3,000-500,000 roentgens of radiation an hour.

By using smaller doses of irradiation (radio-pasteurization), the bacterial population of micro-organisms can be reduced 90-99 percent without causing undesirable changes in food.

In the past years, the College has done considerable irradiation research on meats and seafoods. This research will be expanded and other work on genetic changes in insects, irradiation damage to plastics and other materials, and radiation decomposition of chemicals will be started.

The cobalt irradiation instrument is about $3\frac{1}{2}$ feet high and $2\frac{1}{2}$ feet in diameter. For safety, the cobalt-60 irradiation source is shielded with one foot of lead. The radioactivity is in 12 cobalt pencil-like rods measuring a half-inch in circumference and six inches in length.

Some research has already been done on irradiation of fishery products. It is hoped that new developments in this field will eventually result in extending the shelf-life of fishery products. (Food Field Reporter, March 27, 1961.)



King Crab

KING CRAB TAG-RETENTION STUDIES STARTED:

Using the chartered vessel Stag, a king crab tagging study in Tutka Bay, Alaska, was started early this year by U. S. Bureau of Commercial Fisheries biologists from the station at Kasitana Bay. For the king crab tag-retention study, a total of 1,100 crabs were tagged; 1,000 with loop tags and 100 with dart tags. This population of crabs is semi-isolated, which is particularly suited to tag-retention experiments.



Marketing

EDIBLE FISHERY PRODUCTS MARKETING PROSPECTS, SPRING- EARLY SUMMER 1961:

United States civilian per capita consumption of fishery products was about the same this past winter as in winter 1960, and was expected to continue close to the year-earlier rate in the next few months. The average retail prices of fishery products were noticeably higher this January-March than last. Average prices for these foods in the next few months were expected to remain well above the year-earlier level.



Supplies of edible fish and shellfish this spring and early summer will likely be at least as large as a year earlier. Commercial landings, now on the seasonal upturn, were expected to reach a peak around mid-year. During the first quarter of 1961, landings were well above those of the same part of 1960. Imports of fresh and frozen fishery products, which were noticeably higher this January-March than last, were likely to continue above the year-earlier level in the next few months, while exports might remain lower.

Stocks of food fish and shellfish were close to the low point of the year. Holdings of the frozen products were almost 7 percent higher this April 1 than last. They were expected to increase seasonally in the months ahead. Packers' stocks of the canned products were slightly higher at the beginning of this year than on the same date in 1960. They were expected to continue to decline seasonally until the 1961 canning season is well under way in late spring and summer.

This analysis appeared in a report prepared by the Agricultural Marketing Service, U. S. Department of Agriculture, in cooperation with the Bureau of Commercial Fisheries, U. S. Department of the Interior, and published in the former agency's May 9, 1961, release of The National Food Situation (NFS-96).



Maryland

NEW "NATURAL RESOURCES INSTITUTE" RESPONSIBLE FOR FISHERIES RESEARCH:

A new natural resource agency was forged when Maryland's Governor signed a bill uniting the State Department of Research and Education with the University of Maryland, thus joining the State's top efforts in research and education on natural resources. Effective June 1, 1961, the former department will be known as the Natural Resources Institute of the University of Maryland.

The Institute will continue to conduct a comprehensive research and educational program covering fisheries of marine and fresh waters, game, forestry, pollution problems, and related fields. It will work closely as part of the Board of Natural Resources with the agencies responsible for managing the natural resources, and will specialize in research for the Game and Inland Fish Commission, Tidewater Fisheries Commission, Water Pollution Control Commission, and the Department of Forests and Parks.

Dr. L. Eugene Cronin, who has directed the Department of Research and Education since 1955, will serve as first Director of the new Institute. Commenting on the change in status, Cronin says, "This new relationship provides an excellent opportunity for further improvement in the quantity and quality of Maryland's efforts to protect and develop her natural resources. It is good that the Institute will remain part of the Board of Natural Resources and the primary research agency on many of the problems facing the management agencies. We will gain, and the State will gain, by having the many specialists and facilities of the University more available to assist on these problems. I think the new Institute can conduct a strong program of highly practical research, undertake the broad and continuing

basic studies which are essential if practical research is to be successful, and aid in the education of the public and of specializing students."

The new Natural Resources Institute can trace its history to the founding of the Chesapeake Biological Laboratory at Solomons Island, Md., in 1929. It was established by the Conservation Department in close association with the University of Maryland and directed by Dr. R. V. Truitt until 1955. This laboratory has the distinction of being the oldest state-supported marine biological laboratory in continuous use on the East Coast.

In 1941 the State Legislature created the Department of Research and Education, incorporating the Laboratory into a broader natural resource program, including research in inland resources, wildlife, freshwater fish, forestry, and conservation education. At present, marine research is centered at Solomons, the inland resources and conservation education divisions are located in Annapolis, and a new Western Maryland center will be established in the near future.



North Atlantic Fisheries Exploration and Gear Research

COMPARISON STUDIES CONTINUED OF STANDARD MANILA OTTER TRAWL WITH ONE CONTAINING POLYPROPYLENE PARTS:

M/V "Delaware" Cruise 61-6: Additional tests of an experimental otter trawl were made during an April 14-25, 1961, cruise of the U. S. Bureau of Commercial Fisheries exploratory fishing vessel Delaware. The experimental net, in which the top wings, top belly, and square were constructed of 42-thread-cotton-equivalent-diameter size polypropylene fiber twine, was found to catch more fish than the standard No. 41 manila twine trawl with which it was compared. The results are in agreement with those of a previous cruise (61-2) when a similar net with upper sections of a lighter polypropylene twine caught 66 percent of the trip's total fish, while the conventional net caught 34 percent. During the April cruise, the polypropylene-equipped net took 57 percent of the fish as compared to 43 percent taken with the all-manila

net. Equal numbers of tows were made with each type of net during both cruises.



Instrument used to take internal mesh measurements (M/V Delaware Cruise 61-6).

A total of 110 1-hour tows was conducted with the two trawls during the cruise in a confined area (3 by 12 miles) on Georges Bank. The trawls were rigged to the same measurements using the same rollers and doors, and both were fished on the starboard side. The trawls were changed every 2 tows and operations were continued on a 24-hour per day basis. Each individual fish of commercially-valuable species was counted and measured.

Catch Results, M/V <u>Delaware</u> Cruise 61-6 (108 tows) ^{1/}					
Species	Catch			Percentage of Catch	
	Polypropylene Net	Manila Net	Total	Polypropylene Net	Manila Net
Haddock	1765	873	2638	67	33
Cod	1041	1121	2162	48	52
Sea Dabs	3047	2333	5380	57	43
Pollock	263	334	597	44	56
Yellowtail flounder	200	95	295	68	32
Gray sole	55	50	105	52	48

^{1/}Two tows were deleted from all calculations as not being representative. A large school of cod and pollock was encountered during these tows, made with the polypropylene-equipped net, which would have weighted catches disproportionately because of obviously increased availability of fish.

Internal, wet after-use measurements were taken of the top sections of both trawls. The dry before-use, polypropylene, 5-inch netting of a 42-thread-cotton-equivalent-diameter size, when measured after-use and while wet, had an average mesh size (stretched measure between knots) of 4.76 inches. The 5-inch, 100 yard 3-ply manila netting averaged wet after-use, 4.42 inches.

Also in agreement with findings of cruises 61-2 and 61-6 of the Delaware, captains of three commercial vessels report favorably on fishing results obtained using Bureau-supplied net sections and ropes aboard their own boats. These reports indicate higher catch rate, easier handling and easier towing of the polypropylene-equipped nets. The chief engineer of one of the vessels reported that his engine exhaust temperatures were consistently lower when the experimental net was towed although the same propeller r.p.m. was maintained as with the standard net. The lighter engine loading indicates a lower water resistance of the net and resultant higher towing speed.

In addition to positive results obtained, certain objectionable qualities of the synthetic material were noted. Because of its black color, broken strands were harder to find for mending--especially at night-time and, because of the hard slick surface, special effort was required to tie knots that would hold. Many broken meshes that were believed at first to be a result of parted twine were found to be caused by a slippage of the twine bobbin "end knots" tied during netting manufacture. (The visibility problem can be readily solved by having the twine made up in another color. Elimination of the knot slippage will probably require modifications of the fiber or treatment of the twine.)

The $3\frac{3}{4}$ -inch-circumference headrope which initially measured 78 feet in length stretched to 86 feet during fishing trials. This is an increase of 9.06 percent which is within the manufacturer's stated elasticity (10 percent) for this material. The rope was found to have returned to a length of 78 feet-5 inches three days after completion of the cruise.

Fishing results to date indicate that replacement of the heavier-than-water materials in the top part of the trawl with buoyant materials, probably allows the headrope to rise higher. Because of reduced water

resistance of the polypropylene twine the net tows easier and it is likely that the footrope may tend bottom better. Increased catches experienced are attributed to these factors.

Note: Also see Commercial Fisheries Review, April 1961, p. 26.



North Atlantic Fisheries Investigations

BIOLOGICAL DATA ON GEORGES BANK SEA SCALLOPS COLLECTED:

M/V "Delaware" Cruise 61-7: As part of the U. S. Bureau of Commercial Fisheries research program on sea scallops, the Bureau's research vessel Delaware collected biological data at 160 stations on Georges Bank during a 10-day cruise that ended early in May 1961. Fishing operations were conducted on four major Georges Bank sea scallop production areas.

During the cruise 180 bathythermograph casts were made to obtain hydrographic data associated with the fishing stations. About 400 live scallops were brought back to the Bureau's Woods Hole (Mass.) Biological Laboratory for detailed study. In addition, several offshore species of fish were returned for the display tanks in the new Bureau aquarium. A fine collection of bottom invertebrates were also obtained which included several varieties of starfish, sea anemones, giant barnacles, and many other marine animals.

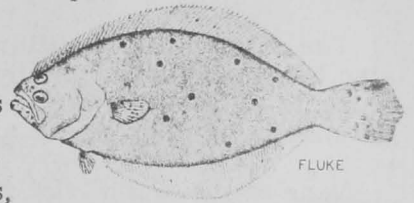
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FLUKE TAGGED OFF EASTERN LONG ISLAND:

A total of 1,800 fluke (summer flounder) were tagged and released on offshore grounds southeast of Long Island in 50-70 fathoms of water by U. S. Bureau of Commercial Fisheries biologists. This area is near Hudson Canyon and in the area where commercial concentrations of fluke are found in winter and early spring, following their fall offshore movement. The fluke were tagged with red and white plastic discs which were attached to the edge of the fish just behind the head.

Presumably, many of these tagged fish will be caught this summer in coastal waters from Delaware Bay to Cape Cod. Tag recoveries will provide useful information on migrations and the biology of this valuable sport and commercial fish. The help of fishermen and others handling fish is needed for

the success of tagging studies. If you find a tagged fluke, take it to the nearest Federal or state fisheries representative or mail the tag to the U. S. Bureau of Commercial Fisheries, Woods Hole, Mass. Be sure to give your name and address, date and place where the fish was caught (if you have this information), and method used to catch it.



A reward of \$1 will be paid for each tag turned in. If both tag and fish are brought in so that measurements can be made, \$2 will be paid. For your cooperation the Bureau will also send you details of the tagging.

Oceanography

DUKE UNIVERSITY TO BUILD BIOLOGICAL OCEANOGRAPHIC VESSEL:

Increased knowledge of marine biology on the central Eastern Seaboard will be made possible by a National Science Foundation grant to Duke University, according to a June 9, 1961, news release.

The \$618,276 grant will enable Duke's Marine Laboratory near Beaufort, N. C., to construct a biological oceanographic vessel, one of the first major United States research vessels to be designed and built with biological oceanography as its prime function. Students will also receive training in the marine sciences aboard the vessel.

The grant provides for a design and feasibility study, construction and fitting of the vessel, and installation of oceanographic equipment. It will also help build a pier extension at the Marine Laboratory's Piver's Island site across the Newport River from Beaufort, a storehouse for ship's gear, and a laboratory for use of participants in a proposed cooperative research and training program.

The vessel will be about 120 feet in length. It will accommodate approximately 12 scientists and graduate students, and 8 crew members. Capable of work on the high seas, it will operate primarily from Virginia to North Florida, and from the shoreline through the Gulf Stream to the outer edge of

the continental shelf. The ship will be of steel construction with an 800-horsepower engine and a cruising speed of 10 to 11 knots.

The ship and its ancillary facilities will also be available for use by scientists and students of other institutions interested in the marine biology of the Atlantic Coast.

None of the marine laboratories in the Duke area has vessels large enough to work safely in offshore waters. Acquisition and operation of this vessel will enable Duke and other interested universities to extend the scope of their research to include the deep ocean as well as the estuaries and immediate coastline.

Research will be carried out on such problems as seasonal abundance and breeding seasons of important fish and other organisms, food chains and productivity, the distribution of flora and fauna, types and qualities of substrate, and seasonal distribution of planktonic larvae. The vessel will also make possible a more comprehensive study of the migration of crustaceans and fish.

Duke's Marine Laboratory, which occupies 13 acres of the southern portion of Piver's Island, is an administrative unit of Duke's College of Arts and Science. It is only 1.5 miles from open ocean.

* * * * *

VERTICAL OCEAN CIRCULATION HELPS TO FEED FISH:

Vertical circulation of ocean waters near the ocean surface is helping to feed the fishes of the sea. U. S. Navy scientists have measured distinct sinking and upwelling of water masses near the surface for the first time, the Navy's Electronics Laboratory in San Diego, Calif., reported. The currents could continually bring up food from the depths for the surface marine life and also take down the surface food, such as plankton, for the larger fish in the deeper depths.

The currents are formed by relatively large waves that are found where cold deeper layers meet the warmer surface layers. These "internal waves" create vertical currents as they roll along.

Knowledge of these currents is very desirable for underwater missile launching,

submarine movement, and the distribution of food for marine life. Television and movie cameras were used to spot the currents. The equipment was housed in a car suspended from a tower, one mile off the California coast.

Similar investigations in the Atlantic Ocean, Indian Ocean, and the Gulf of Mexico strongly indicate that the vertical current movement is world-wide.

The origin of the "internal waves" is still a mystery. Some scientists believe storms far out at sea start the waves, others think they are due to cold and warm layers meeting.



Oregon

FROZEN FISH AND SHELLFISH DEALER LICENSE RULE CHANGED:

The law requiring Oregon retail dealers and wholesale distributors handling or dealing in packaged frozen food fish or packaged frozen shellfish to have a license was repealed by the 1961 legislature, the Oregon Fish Commission auditor reminded dealers on May 11, 1961. The repeal is to become effective August 9, 1961.

Retail and wholesale distributors in Oregon handling packaged frozen food fish or packaged frozen shellfish only, at any time prior to August 9, 1961, will be required to have the proper license at the regular fee of \$3 for a retail dealer, or \$10 for a wholesale distributor.

The present law does not permit refunding fees to those who have bought licenses for the entire license year ending March 31, 1962, nor does it permit the issuance of licenses for part of a license year.

Wholesalers, peddlers, and retail dealers handling fresh and unpackaged frozen food fish or shellfish will still be required to have the proper license.



Oysters

STEEL RAFT FOR GROWING OYSTERS DEVELOPED BY TEXAS INVENTOR:

A Texas inventor has applied for a patent on a steel raft developed for growing oysters in Texas waters.

The raft is made of 4-foot diameter steel pipe with three braced cross-pipes of 6-inch diameter and 33 feet long. The over-all dimensions are 34 feet by 41 feet.

The raft is to be towed to the seeding grounds, where it will be sunk. On the raft there are uprights along which reinforcement rods are placed. From the rods there will be stringers of plastic strips that will act as the cultch for collecting the oyster spat. The raft, after the oyster spat has set, will be raised, if this appears necessary, and towed to the growing area. When the oysters mature, the raft will again be raised and towed directly to the dock. It is estimated it will take approximately 45 minutes to one hour to raise the raft and this will be the only labor involved until the dock has been reached.

The purpose of using this method is to save labor in harvesting and to have mobility to pre-select areas having optimum growing conditions.

If this project works as planned, several more larger-size rafts will be built.

The inventor has conferred with shellfish biologists and feels that the raft method has possibilities.



Polish Modern Stern-Type Trawler Factoryship

ENTERS U. S. PORT FOR REPAIRS:

A modern Polish stern-trawler factoryship was in Boston, Mass., during March this year for repairs to a damaged propeller. This vessel is the same type that the Polish have been making for Russia. The vessel was built in Gdynia, Poland, 1959, of 2,670 gross tons, about 281 feet long with a 45-foot beam and 17-foot draft; the vessel has a speed of about $13\frac{1}{2}$ knots.

The trawler had been fishing on the Grand Banks and off Greenland for ocean perch and cod, but was caught in ice for 10 days. The fishermen work 4 hours on and 4 hours off during the day and 6 hours on and 6 hours off at night and sleep two to a stateroom. The crew consisted of 105 men when they docked at Boston.



Fig. 1 - The modern Polish stern trawler viewed from the bow while in drydock at Boston, Mass.

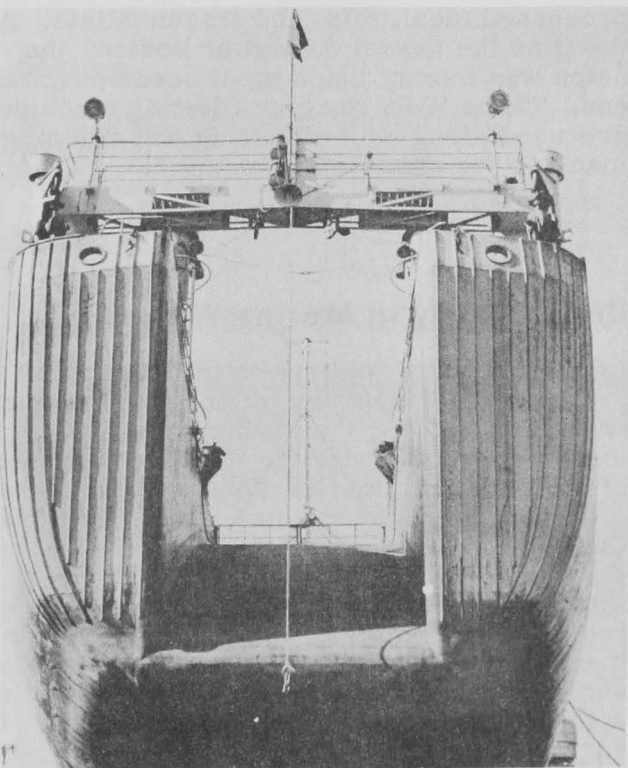


Fig. 2 - View from outside of stern section of Polish stern trawler showing the chute for launching and retrieving the otter trawl.

The vessel is usually at sea about 70 days to a trip and then stays in port a month.

It can carry enough oil, food, and other supplies for the complete trip, with the exception of a stop for fresh water. The vessel's base of operations is Gdynia.

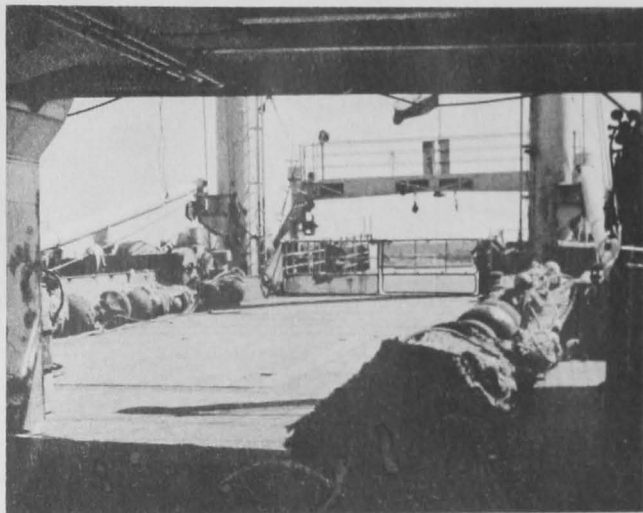


Fig. 3 - View from inside of stern section of the Polish stern trawler with nets stowed on each side of clear deck space.

The Polish vessel can process a catch of 36 tons a day and the gross holding capacity of the vessel is about 2,500 metric tons of processed meal, oils, and frozen fillets. At the time the vessel docked at Boston, the catch was mostly made up of ocean perch and cod. Three West German filleting machines are used along with a heading and skinning machine for processing the catch.



Radioactivity in Marine Waters

LONG-RANGE STUDY ANNOUNCED:

The U. S. Public Health Service announced on March 2, 1961, the beginning of a joint long-range study with the U. S. Department of the Interior of radioactivity in the estuarial waters of the Savannah River, near Savannah, Ga.

The purpose of the study is to trace the routes of radioactivity in a marine environment, from its source to possible human consumption, and to study factors affecting the uptake or reconcentration of radioactivity by various forms of marine life. Measurement of the levels of radioactivity present in the marine environment, including water, fish mollusks, aquatic plants, silt, and suspended solids, will be conducted by the Public Health Service in the estuary and, later, in the upstream waters of the river.

The initial phase of the study will consist of monthly and seasonal collections of water and silt samples, shrimp and crabs, oysters, minnows, and other types of fish life, together with marine plants. The samples will be examined by the Public Health Service radiological laboratory at Montgomery, Ala., where an analysis for specific radioactive substances such as strontium-90 will be conducted. The U. S. Fish and Wildlife Service is performing specialized analyses of marine organisms.



Research Vessels

LOUISIANA FIRM TO CONSTRUCT FISHERY RESEARCH VESSEL:

A \$1,773,948 contract for construction of an ocean fishery research vessel for use primarily in the Northwest Atlantic has been awarded to the Southern Shipbuilding Corporation of Slidell, La., Secretary of the Interior Stewart L. Udall announced on May 17, 1961.

Bids were opened on April 14, 1961. There were five bidders. The vessel was designed by Dwight S. Simpson and Associates, naval architects and marine engineers of Boston, Mass. The vessel will replace the *Albatross III* which was deactivated more than a year ago.

This vessel is one of the first to be constructed under the new national oceanographic program which has received endorsement and impetus by the President. It is a program under which concerted attention will be given to the whole national effort in basic and applied ocean research.

One of the objectives of the fisheries part of the oceanographic investigations is to help the domestic industry in the quest for the three billion additional pounds of fish the Nation will be consuming 20 years hence. Another is to add to the accumulating oceanographic knowledge through water temperature findings, data on the chemical content of sea water at various places and under various conditions, factors affecting plant and animal life in the sea, information on surface and subsurface water movements, and many other kinds of oceanographic data acquired automatically in fishery biological studies.

The naval architects designed the vessel to meet the needs set forth by the fishery scientists of the U. S. Bureau of Commercial Fisheries. A vessel design committee (composed of biologists) conferred often with the architects to help design a ship which will be functional both from the standpoint of a floating laboratory and an ocean-going ship. Its task will be to perform the numerous studies necessary to determine the distribution and the variation in abundance of the bottomfish of the Northwest Atlantic and to conduct various phases of oceanographic research.

It will be a stern trawler, the first to be built in the United States and to operate from a North American port. It is patterned after the new German and Danish stern trawlers, and will be equipped with a ramp to haul the loaded nets aboard. This permits the continuance of exploratory or experimental fishing during heavy weather.

The ship will be of welded steel construction, single bottom, and with single screw and rudder. It will have one continuous deck, two partial decks, and two superstructure decks, with laboratories and scientific equipment. Adequate berth and mess space will be provided for 16 scientists and 25 crew members.

The vessel will have over-all length of 187 feet. Length at the waterline will be 173 feet nine inches. The beam is 33 feet. The ship has a ready-for-sea-displacement of 1,000 tons, will travel 12 knots an hour, and has a range of 9,000 miles. It will carry 80 tons of fresh water. It is designed for use in general fisheries and oceanographic research in any navigable waters in the world in all seasons and in all reasonable conditions of weather and temperature.

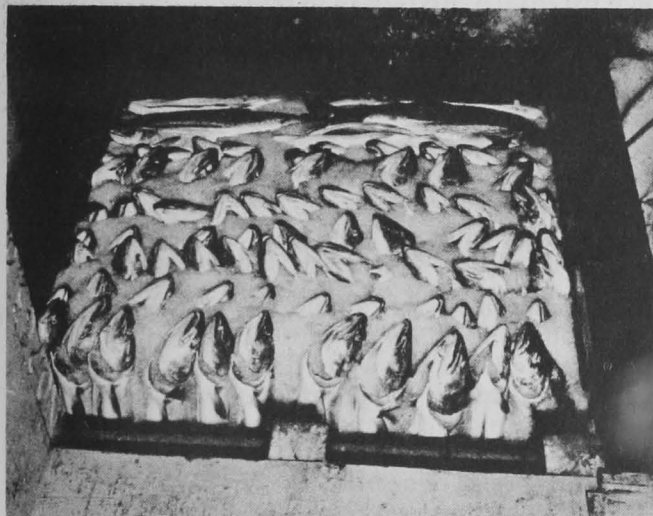
The cost of \$1,773,948 includes basic laboratory and research facilities. Following construction, which is estimated at 15 months, the vessel will be based at Woods Hole, Mass.



Salmon

UTILIZATION OF UNITED STATES LANDINGS, 1956-60:

During the 5-year period, 1956-60, United States landings of salmon varied between a high of 324.2 million pounds in 1956 and a low of 201.7 million pounds in 1959. The



Iced troll-caught salmon aboard an Alaska troller.

average amount of salmon used for canning during the five-year period was close to 87 percent, varying between 89.0 percent in 1960 and a low of 85.3 percent in 1958. The five-year average disposition of salmon landings for other than canning was 3.0 percent for mild-curing, 4.7 percent for the fresh market trade, and 5.3 percent for freezing.

Utilization of United States Salmon Landings, 1956-60					
Year	Canned	Mild-Cured	Fresh	Frozen	Total
	(1,000 Lbs.)				
1960 . .	214,382	6,527	7,699	12,392	241,000
1959 . .	173,990	9,258	6,967	11,469	201,684
1958 . .	262,381	9,690	21,453	13,933	307,457
1957 . .	232,229	6,831	13,741	12,352	265,153
1956 . .	282,270	7,070	14,513	20,396	324,249

Scallops

SHUCKING MACHINES DEVELOPED FOR CALICO SCALLOPS:

Two different companies already have successfully developed shucking and separating machines for calico scallops, and a third company is now testing shucking and separating machines. One company has already established a pilot plant in Cocoa, Fla., and a second company is expected to erect a plant in the very near future. The third company presently experimenting with shucking and separating machines is a very prominent fish processing company.

The calico scallop (*Pecten gibbus*) is a species of scallop smaller than the regular New England scallop. Extensive grounds of the scallops were discovered off the east coast of Florida (from Daytona Beach southward to Ft. Pierce in depths of 10 to 32 fathoms) in 1960 by U. S. Bureau of Commercial Fisheries exploratory fishing work.

Note: Also see *Commercial Fisheries Review*, July 1960 p. 41.



Shrimp

U. S. PRODUCTION OF SHRIMP PRODUCTS, 1952-60:

The United States production of manufactured shrimp products in 1959 amounted to 163.6 million pounds valued at \$115.1 million at the plant. Compared with 1958, this was an increase of 10 million pounds, but a drop in value of \$13 million because of lower prices in 1959.

The larger 1959 pack was almost all due to an increase in fresh and frozen shrimp--148 million pounds in 1959 as

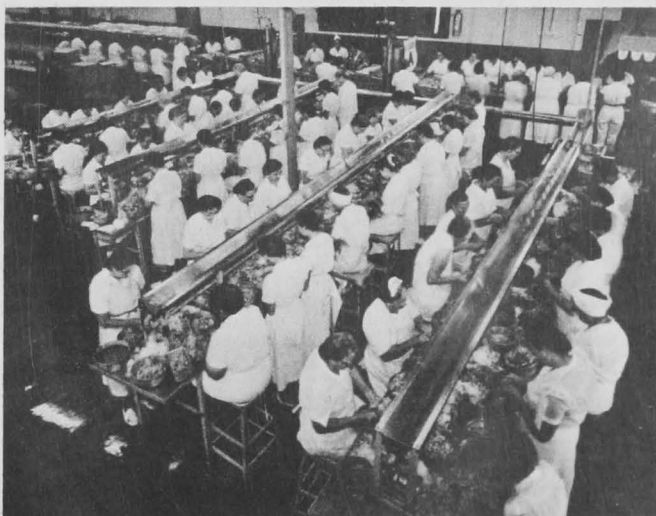


Fig. 1 - Hand peeling and deveining of shrimp at a large shrimp-processing plant in Tampa, Fla.

Table 1 - U. S. Production of Shrimp Products, 1952-1960

Item	1960		1959		1958		1957		1956		1955		1954		1953		1952		
	Qty.	Value	Qty.	Value	Qty.	Value	Qty.	Value	Qty.	Value	Qty.	Value	Qty.	Value	Qty.	Value	Qty.	Value	
	1,000 Lbs.	US\$ 1,000	1,000 Lbs.	US\$ 1,000	1,000 Lbs.	US\$ 1,000	1,000 Lbs.	US\$ 1,000	1,000 Lbs.	US\$ 1,000	1,000 Lbs.	US\$ 1,000	1,000 Lbs.	US\$ 1,000	1,000 Lbs.	US\$ 1,000	1,000 Lbs.	US\$ 1,000	
Fresh and Frozen:																			
Raw, headless	1/	1/	61,598	36,980	63,276	48,214	58,268	45,070	61,355	42,633	69,123	36,690	82,416	43,115	61,990	41,497	59,536	35,919	
Peeled, raw (incl. deveined)	-	-	11,096	9,945	7,622	8,450	9,375	9,952	7,512	7,304	6,745	5,896	4,156	2,605	610	382	280	192	
Cooked (incl. peeled & deveined)	-	-	1,891	2,816	2,080	3,405	1,444	2,488	2,237	3,101	1,758	1,798	1,607	2,056	759	1,124	2,548	3,350	
Breaded (raw & cooked)	-	-	69,764	45,314	60,865	43,622	51,085	37,764	50,888	37,301	38,991	26,907	24,802	17,579	17,438	13,393	17,265	12,841	
Specialties (soups, stews, sticks, etc.)	-	-	3,636	2,693	3,664	2,938	3,555	2,859	2,907	1,688	1,657	1,252	524	460	1/	1/	1/	1/	
Total fresh & frozen	1/	1/	147,985	97,748	137,507	106,629	123,727	98,133	124,899	92,027	188,274	75,543	113,505	65,815	80,797	56,396	79,629	52,302	
Canned:																			
Natural (drained weight)	2/	13,965	16,920	13,832	16,948	14,308	20,790	9,120	13,136	13,636	16,421	13,516	13,562	14,021	13,691	15,242	18,947	12,269	12,999
Specialties (soups, stews, etc.)	-	261	61	178	51	246	94	394	159	571	336	287	116	305	101	410	205	467	225
Total canned	14,226	16,981	14,010	16,999	14,554	20,884	9,514	13,295	14,207	16,757	13,803	13,678	14,326	13,792	15,652	19,152	12,736	13,224	
Other:																			
Sun-dried	1/	1/	322	291	349	494	347	561	471	607	498	416	990	611	3/923	903	3/1,105	1,095	
Cured (salted, pickled, & smoked)	1/	1/	12	24	57	92	76	103	37	56	69	74	3/	3/	3/	80	2,068	3/	
Meal and bran	340	10	1,254	39	1,162	30	808	24	1,122	34	1,036	35	1,770	51	2,000	80	2,068	3/	
Total other	1/	1/	1,588	354	1,568	616	1,231	688	1,630	697	1,603	525	2,760	662	2,923	983	3,173	1,182	
Grand total	1/	1/	163,583	115,101	153,629	128,129	134,472	112,116	140,736	109,481	133,680	89,746	130,591	80,269	99,372	76,531	95,538	66,708	

1/ Data not available.
2/ Preliminary.
3/ Cured shrimp are included with sun-dried shrimp.



Fig. 2 - Raw breaded shrimp on conveyor belt moving to weighing and packaging line.

compared with 137 million pounds the previous year, but the value was nearly \$9 million less. More frozen breaded (raw and cooked) shrimp and raw peeled and deveined shrimp was packed in 1959 than in any previous year in the history of the shrimp products industry. It is estimated that the 1960 production of frozen breaded and raw peeled and deveined shrimp will exceed that for 1959. The 1959 pack of frozen breaded (raw and cooked) shrimp was 9 million pounds more than the previous year. The production of raw peeled and deveined shrimp in 1959 totaled 11.1 million pounds--an increase of 3.5 million pounds over 1958. The 1959 canned shrimp (natural-drained weight) pack declined only 0.5 million pounds from the previous year but the value dropped \$3.8 million because of lower prices.

The only data presently available for 1960 are for canned shrimp and several other shrimp specialties. The 1960 canned shrimp (natural-drained weight) pack of 14 million pounds valued at \$16.9 million was about the same as in 1959.



South Atlantic

Exploratory Fishery Program

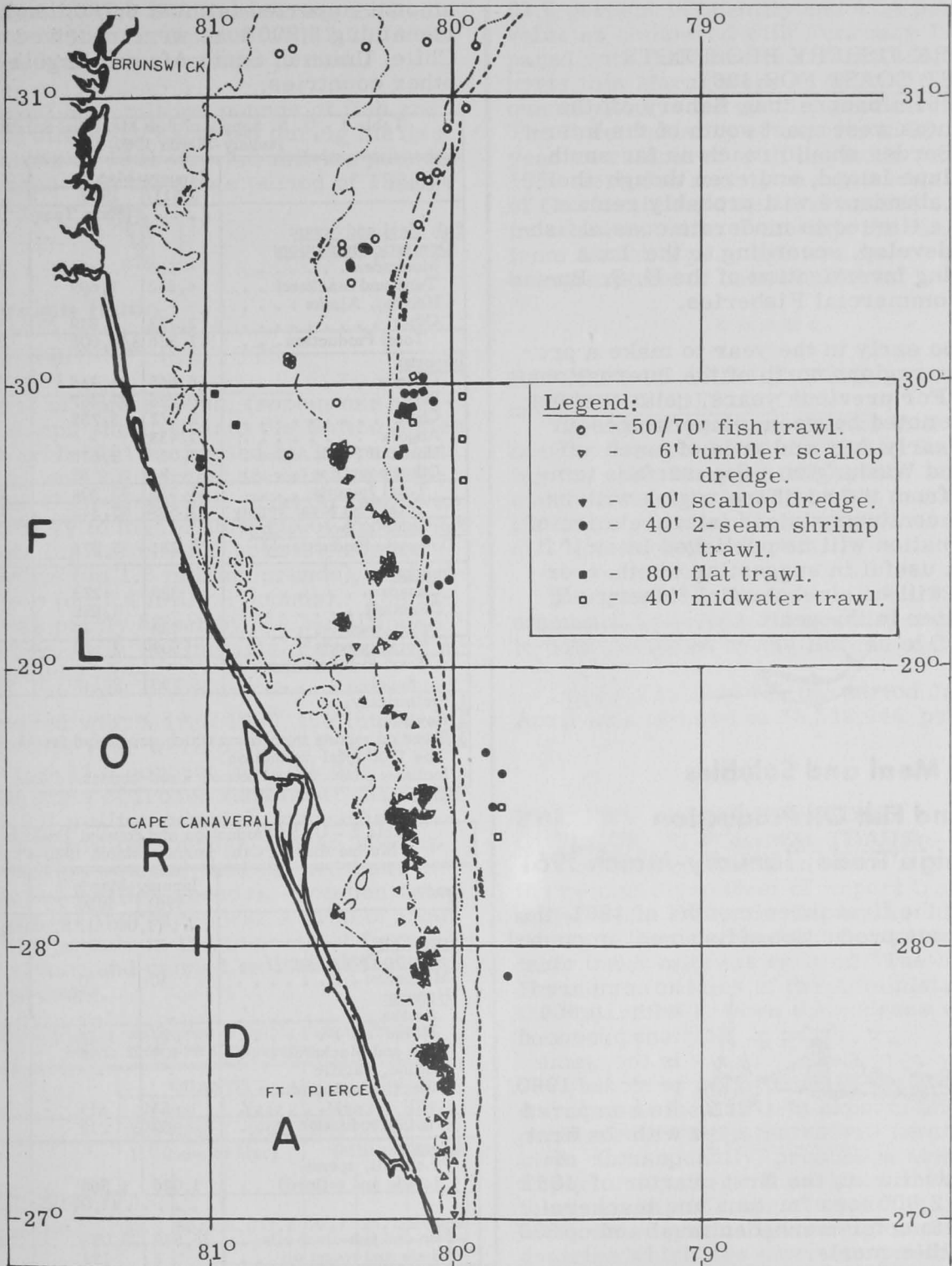
FISH AND SHELLFISH EXPLORATION OFF GEORGIA AND FLORIDA:

M/V "Silver Bay" Cruise 30: On May 11, 1961, the U. S. Bureau of Commercial Fisheries exploratory fishing vessel Silver Bay completed another of a series of cruises designed to determine the fishery resources off the coasts of Georgia and Florida. During the cruise, 200 stations were occupied along the Continental Shelf and Slope between Brunswick, Ga., and Ft. Pierce, Fla.

Fish trawling was conducted at 37 stations using a 50-foot headrope and 70-foot footrope roller-rigged fish trawl to determine the commercial availability of snapper, grouper, and related species. Maximum catches of readily salable species were about 1,000 pounds per hour, comprised of some 60 percent vermilion snapper, 20 percent porgies, and 20 percent other snappers and grouper. All successful fish trawling was conducted in conjunction with recorder indications of fish concentrations. No gear damage was experienced during this phase of cruise 30.

Royal-red shrimp (Hymenopenaeus robustus) were trawled at 17 stations between St. Augustine and Cape Canaveral, Fla., to compare the potential with that observed in previous years. One 24-hour fishing period (5 drags) working in depths of 164 to 190 fathoms produced 1,195 pounds (heads-on) of 31-35 count royal-red shrimp.

Further delineation of the calico scallop bed off Cape Canaveral was conducted with 135 stations made in 10 to 40 fathoms between Summer Haven and Jupiter Inlet. Dead shell and varying amounts of live



M/V Silver Bay Cruise 30 (April 17-May 12, 1961).

scallops were taken over the entire area surveyed. Using a 6-foot tumbler dredge catches ranged up to a maximum of $9\frac{1}{2}$ bushels of medium (average diameter 21 inches) scallops

which yielded 3 to $3\frac{1}{2}$ pints of meats from the average 75-pound bushel of shell stock.

Note: Also see Commercial Fisheries Review, May 1961 p. 24, May 1960 p. 29, March 1960 p. 26, and February 1960 p. 42.



Tuna

ALBACORE FISHERY PROSPECTS OFF WEST COAST FOR 1961:

The 1961 albacore tuna fishery off the United States west coast south of the International Border should reach as far south as Guadalupe Island, and even though the center of abundance will probably remain offshore, a limited to moderate coastal fishery may develop, according to the Tuna Forecasting Investigation of the U. S. Bureau of Commercial Fisheries.

It is too early in the year to make a prediction for regions north of the International Border. For previous years, relationships have been noted between temperatures in June and early July and area of catch off Oregon and Washington. Sea-surface temperature from the northern region will be examined continuously and interpretation of the information will be published later if it is thought useful in suggesting whether or not there will be a substantial fishery off Oregon later in the year.



U. S. Fish Meal and Solubles Supply and Fish Oil Production and Foreign Trade, January-March 1961

During the first three months of 1961, the United States production of fish meal amounted to 7,600 tons as compared with 10,000 tons produced in the same period of 1960. As compared with the first quarter of 1960, production in the first quarter of 1961 was down 2,800 tons for tuna and mackerel, and up 41 tons for menhaden meal and up 350 tons for other meals.

Imports of fish meal and scrap totaled 44,300 tons for January-March 1961--higher by 9,000 tons than during the same period of last year. Imports from Peru (30,700 tons) made up 69 percent of the total imports, while Canada followed with the next largest

amount imported (almost 6,700 tons). The remaining 6,900 tons were received from Chile, Union of South Africa, Angola, and other countries.

Table 1 - U. S. Supply of Fish Meal and Solubles, January-March 1960-61

Product	January-March		Total 19602/
	19611/	1960	
. (Short Tons)			
Fish Meal and Scrap:			
Domestic Production:			
Menhaden	531	490	218,423
Tuna and mackerel	4,852	7,699	26,325
Herring, Alaska	-	-	6,071
Other	2,173	1,819	38,897
Total Production	3/7,556	3/10,008	289,716
Imports:			
Canada	6,665	11,316	30,982
Peru	30,726	17,467	68,156
Chile	2,377	3,758	21,183
Angola	1,433	-	888
Union of South Africa	3,036	2,678	7,073
Other countries	96	85	3,279
Total Imports	44,333	35,304	131,561
Total Fish Meal Supply	51,889	45,312	421,277
Fish Solubles (wet weight):			
Domestic Production4/			
	5,281	5,971	98,929
Imports:			
Canada	329	273	869
Denmark	-	1,858	1,858
Other countries	180	45	447
Total Imports	509	2,176	3,174
Total Fish Solubles Supply	5,790	8,147	102,103

1/Preliminary.
2/Revised.
3/Based on reports from firms which accounted for 93 percent of the 1960 total production.
4/Includes production of homogenized-condensed fish.

Table 2 - U. S. Production and Foreign Trade in Marine Animal Oils, January-March 1960-61

Product	January-March		Year 1960
	1961	1960	
. . . (1,000 U. S. Gallons) . . .			
Marine Oils:			
Domestic Production:1/			
Menhaden	10	10	24,454
Herring:			
Alaska	-	-	1,385
Maine	2/	2/	133
Tuna and Mackerel	101	97	507
Sardine, Pacific	-	-	144
Other (including whale oil)	51	111	1,204
Total Production 1/	162	218	27,827
Imports:			
Whale oil, sperm (crude and refined)	1,026	1,566	4,837
. (1,000 Lbs.)			
Exports:			
Fish and fish-liver oils	36,549	29,053	143,659
Whale and sperm oil	2	794	1,401

1/Preliminary.
2/Quantities of herring oil are included in "unclassified" in order to avoid disclosure of an individual firm's production.

During the first three months of 1961, the domestic production of fish solubles amounted to 5,300 tons--a drop of 700 tons from the same period of 1960. Imports of

this product totaled 500 tons during the first quarter of 1961 as compared with 2,200 tons during the 1960 three-months period.

A total of 36.5 million pounds of fish and fish-liver oils were exported during the first three months of 1961--up 7.5 million pounds as compared with the same period of 1960.



U. S. Foreign Trade

EDIBLE FISHERY PRODUCTS, MARCH 1961:

Imports of edible fresh, frozen, and processed fish and shellfish into the United States during March 1961 increased by 1.2 percent in quantity and 3.4 percent in value as compared with February 1961. The increase was due primarily to higher imports of groundfish fillets (up 1.0 million pounds), canned tuna in brine (up 1.6 million pounds), and frozen shrimp (up 1.4 million pounds). The increase was partly offset by a 2.3-million-pound decrease in the imports of frozen albacore and other tuna.

Compared with March 1960, the imports in March this year were up by 4.4 percent in quantity and 14.9 percent in value due to higher imports of frozen tuna other than albacore (up 4.4 million pounds), groundfish fillets (up 3.8 million pounds), frozen shrimp (up 1.8 million pounds), and canned tuna in brine (up 2.2 million pounds). Compensating in part for the increases was a drop of about 4.1 million pounds in the imports of frozen albacore tuna, and canned salmon (down 1.6 million pounds).

Item	QUANTITY			VALUE		
	March		Year	March		Year
	1961	1960	1960	1961	1960	1960
	(Millions of Lbs.)			(Millions of \$)		
Imports:						
Fish & shellfish:						
Fresh, frozen, & processed 1/	83.8	80.2	1,011.2	27.7	24.1	304.8
Exports:						
Fish & shellfish:						
Processed only 1/ (excluding fresh & frozen)	1.7	3.5	48.7	1.0	0.9	19.2

United States exports of processed fish and shellfish in March 1961 were lower by

62.0 percent in quantity and 47.4 percent in value as compared with February 1961. Compared with the same month in 1960, the exports this March were down 51.4 percent in quantity, but were up 11.1 percent in value. The lower quantity of exports in March this year as compared with the same month in 1960 were due mainly to much lower exports of California sardines and canned squid. The increase in value of the exports this March from March a year ago was due to relatively heavy exports of canned salmon.

IMPORTS OF CANNED TUNA IN BRINE UNDER QUOTA:

The quantity of tuna canned in brine which may be imported into the United States during the calendar year 1961 at the 12½-percent rate of duty is 57,114,714 pounds. Any imports in excess of the quota are dutiable at 25 percent ad valorem.

Imports from January 1-April 29, 1961, amounted to 15,083,873 pounds, according to data compiled by the Bureau of Customs.

Imports in 1960 for the period January 1-April 30 amounted to 13,516,144 pounds.

PRESENT ADMINISTRATION'S OUTLOOK ON FOREIGN TRADE:

The current Administration's outlook on the competitive effect of import trade was stated recently by the Deputy Assistant Secretary of Commerce for International Affairs, in an address entitled "The Foreign Economic Policies of the Administration." On May 5, 1961, when the address was delivered, he stated, in part:

"It is to be anticipated in the coming decade that the shifts in exports and imports of the United States will be accelerated. Consequently, producers now in the import competing industries will be under the necessity of improving their production methods or gradually moving out into industries which are more competitive. The United States simply cannot produce everything of everything. It will either have to relinquish certain areas of production, or permit some firms at the margin of efficiency to die.

"There is a hopeful alternative that the rate of growth throughout the world will

permit some industries in the United States to expand rapidly and become export oriented; while the import competing group merely expands less rapidly or stagnates--removing the necessity of any company going out of business.

"While this process of gradual attrition among industries goes on apace as a result of domestic competitive pressures without governmental subsidy or relief, the fact that the rules of the game are changed when tariffs are substantially altered, is justification for government assistance in relocation of industrial activity."



Virginia

INSTITUTE OF MARINE SCIENCE AWARDED GRANT TOWARDS CONSTRUCTION OF NEW LABORATORY:

The Director of the Virginia Institute of Marine Science, announced on May 16, 1961, that the National Institute of Health has awarded a health research facilities grant amounting to \$27,345 to the Institute to defray part of the construction cost of the new microbiology-pathology building now nearing completion.

"The new laboratory will provide space for an expanding research program into the relationships between marine microorganisms and the state of health of all living things, including man," the Director reported. Microorganisms are often thought of as disease producers causing trouble among other plants and animals, but actually many of them are helpful. For example, soil scientists know that a thorough understanding of the soil condition includes knowledge concerning the bacteria and fungi which populate it. There is a direct relationship between these tiny one-celled plants, which live in the soil, and the fertility of the soil itself.

Scientists at the Virginia laboratory suspect that there is a similar situation in the marine and brackish waters; that bacteria and fungi affect growth of oysters and other marine crops, but there is not enough information yet to prove it. The facilities of the new building are designed to help with this problem. It is possible that stream pollution upsets the normal microflora, which in turn has its effects on these waters and their usefulness to man.

Studies to be conducted in this new laboratory may shed much light on problems of the oyster industry, and the Virginia fisheries in general.



Wholesale Prices, May 1961

The May 1961 wholesale price index for edible fishery products (fresh, frozen, and canned) at 128.5 percent of the 1947-49 average increased 2.1 percent from the preceding month, and advanced 1.5 percent from May 1961. The increase in the index from mid-April to mid-May this year was mainly due to higher prices for fresh drawn haddock, fresh or frozen dressed halibut and salmon, and a pronounced upturn in prices for fresh-water varieties. The price increase in fresh drawn haddock was also reflected in an advance in fresh haddock fillet prices. From May last year to this May, higher prices for fresh or frozen dressed halibut and salmon, shucked oysters, frozen haddock and flounder fillets, and canned salmon more than offset lower prices for fresh drawn haddock, the fresh-water varieties, and fresh and frozen shrimp.



Fresh East Coast shrimp on display at one of the stands at Fulton Fish Market, N. Y. C.

The fresh and frozen drawn, dressed, or whole finfish subgroup index for this May increased 11.9 percent from the preceding month. The more significant price increases were in fresh drawn haddock (up 40.0 percent) because of higher ex-vessel prices, and considerably higher prices for the fresh-water varieties. Prices were higher this May for fresh and frozen halibut and salmon, mainly due to higher ex-vessel prices for the fresh product. Compared with May last year, the subgroup index this May increased 3.7 percent. Higher prices for fresh and frozen halibut (up 15.3 percent) and fresh salmon (up 7.0 percent) offset sharp declines in fresh drawn haddock and whitefish prices.

From April to May this year the fresh processed fish and shellfish subgroup index declined 0.8 percent. Higher prices for fresh small haddock fillets (up 9.4 percent) were offset by a decline in the price of fresh shrimp at New York City (down 2.5 percent). As compared with May last year, prices for

Table 1 - Wholesale Average Prices and Indexes for Edible Fish and Shellfish, May 1961 With Comparisons

Group, Subgroup, and Item Specification	Point of Pricing	Unit	Avg. Prices <u>1/</u> (\$)		Indexes (1947-49=100)			
			May	Apr.	May	Apr.	Mar.	May
			1961	1961	1961	1961	1961	1960
ALL FISH & SHELLFISH (Fresh, Frozen, & Canned)					128.5	125.8	131.9	126.6
Fresh & Frozen Fishery Products:					140.6	136.1	146.8	142.2
Drawn, Dressed, or Whole Finfish:					155.6	139.0	161.3	150.1
Haddock, lge., offshore, drawn, fresh	Boston	lb.	.08	.06	78.1	55.8	122.4	94.1
Halibut, West., 20/80 lbs., drsd., fresh or froz.	New York	lb.	.35	.33	107.8	103.1	101.1	93.5
Salmon, king, lge. & med., drsd., fresh or froz.	New York	lb.	.88	.85	197.7	191.0	196.6	184.8
Whitefish, L. Superior, drawn, fresh	Chicago	lb.	.66	.46	163.6	114.0	173.6	183.4
Whitefish, L. Erie pound or gill net, rnd., fresh	New York	lb.	.83	.50	166.9	101.2	141.6	212.5
Yellow pike, L. Michigan & Huron, rnd., fresh .	New York	lb.	.72	.51	167.7	119.6	164.2	170.0
Processed, Fresh (Fish & Shellfish):					142.3	143.4	150.1	145.8
Fillets, haddock, sml., skins on, 20-lb. tins . .	Boston	lb.	.29	.27	98.7	90.2	141.2	91.9
Shrimp, lge. (26-30 count), headless, fresh . .	New York	lb.	.77	.79	120.9	124.0	134.3	135.1
Oysters, shucked, standards	Norfolk	gal.	7.25	7.25	179.4	179.4	173.2	170.1
Processed, Frozen (Fish & Shellfish):					112.8	113.7	115.1	117.7
Fillets: Flounder, skinless, 1-lb. pkg.	Boston	lb.	.39	.39	100.8	100.8	100.8	98.1
Haddock, sml., skins on, 1-lb. pkg.	Boston	lb.	.32	.32	100.5	100.5	105.2	80.1
Ocean perch, skins on, 1-lb. pkg.	Boston	lb.	.29	.29	116.8	116.8	122.8	112.8
Shrimp, lge. (26-30 count), 5-lb. pkg.	Chicago	lb.	.69	.70	105.7	107.2	107.2	123.5
Canned Fishery Products:					112.2	112.2	111.2	104.8
Salmon, pink, No. 1 tall (16 oz.), 48 cans/cs. . . .	Seattle	cs.	28.00	28.00	146.1	146.1	146.1	127.8
Tuna, lt. meat, chunk, No. 1/2 tuna (6-1/2 oz.), 48 cans/cs.	Los Angeles	cs.	11.00	11.00	79.3	79.3	79.3	80.0
Sardines, Calif., tom. pack, No. 1 oval (15 oz.), 24 cans/cs.	Los Angeles	cs.	4.50	4.50	105.0	2/105.0	91.0	93.9
Sardines, Maine, keyless oil, 1/4 drawn (3-3/4 oz.), 100 cans/cs.	New York	cs.	8.75	8.75	93.1	93.1	93.1	93.1
<u>1/</u> Represent average prices for one day (Monday or Tuesday) during the week in which the 15th of the month occurs. These prices are published as indicators of movement and not necessarily absolute level. Daily Market News Service "Fishery Products Reports" should be referred to for actual prices.								
<u>2/</u> Revised due to shift from 48 cans/case to 24 cans/case for California sardines.								

items in the subgroup this May declined 2.4 percent. Increases in the fresh haddock fillet prices at Boston and shucked oyster prices were offset by a decrease (10.5 percent) in the New York City fresh shrimp price.

Wholesale prices this May for frozen processed fish and shellfish also declined slightly (0.8 percent) from the preceding month. Prices of all items were unchanged from the previous month except frozen shrimp at Chicago which dropped 1.4 percent. The subgroup index declined 4.2 percent from May 1960 to this May because of lower frozen shrimp prices at Chicago (down 14.4 percent). The decline

was offset somewhat by higher prices for all frozen fillets (frozen haddock fillets were up 25.4 percent).

There was no change in the subgroup index for canned fishery products from April to May this year. Prices, on the whole, were at the same level as the previous month. Compared with May a year ago, the subgroup index increased 7.1 percent largely due to a 14.3-percent increase in canned pink salmon prices, the same as occurred in April. Canned California sardines were up 11.8 percent, but canned tuna prices were only slightly below (down 0.9 percent) the May 1960 prices. Maine canned sardine prices this May were unchanged from the same month a year earlier.

